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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the fluorescent colorant used for various plastic-molding things, a paint, ink, etc. about fluorescent colorant.

[0002]

[Description of the Prior Art]Generally fluorescent dye is rich in reactivity, and inferior to the robustness over light. As the measure, there are a method of scouring this in a formation thing, and the method of paint-izing and painting as colorant powder which dissolved fluorescent dye in the synthetic resin. These colorant should not yet be satisfied, although weatherability improves compared with the case where fluorescent dye is directly scoured in a formation thing and it has come to be equal to field use.

[0003]On the other hand, the condensed multi-ring system organic compound which makes Quinacridone representation has lightfastness, heat resistance, and the characteristic excellent in solvent resistance, and colorant of various paints, such as a paint for cars, and a polymer material, printer's ink, etc. are utilized widely. It has joined together firmly by stacking or an intermolecular hydrogen bridge, and, as a result, these condensed multi-ring system organic compounds do not dissolve in an organic solvent, or it reaches to an extreme of them, and they are poorly soluble.

Generally fluorescence is not seen or only very weak fluorescence is observed.

[0004]

[Problem(s) to be Solved by the Invention]Compatibility of this invention is high to a binder etc., and an object of this invention is to provide fluorescent colorant excellent in lightfastness.

[0005]

[Means for Solving the Problem]It makes it easy for fluorescent colorant shown in a general

formula [1] to extend intermolecular distance of a quinacridone pigment, and to distribute it by introducing four or more organic residue of the carbon numbers 1-50 into a quinacridone pigment which was insoluble to an organic solvent until now, or its intermediate. As a result, when making fluorescent colorant of this invention contain in resin of the shape of a particle which constructed the bridge, When it was made a coating composition which contains a binder for paints when it is made a plastic-molding thing which it makes it come to distribute in a plastic, or when an ink composition containing an ink binder was used, pulling out fluorescence which was not seen until now was found out.

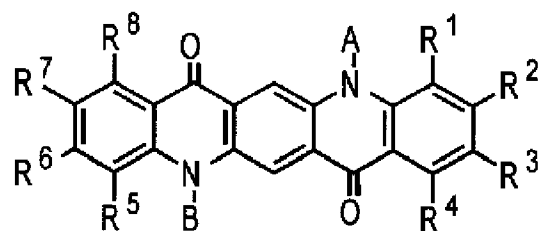
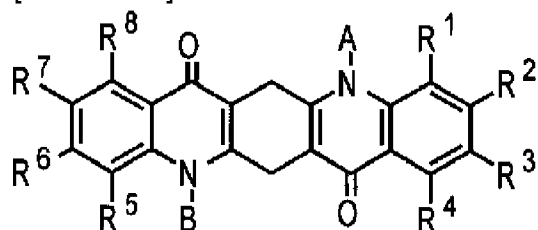
[0006]If concentration quenching explains this phenomenon, when a fused aromatic ring portion of a quinacridone molecule cannot approach mutually and will carry out it, a molecule interval spreads, and it is reasoned if a phenomenon of optical quenching becomes difficult to occur. When fluorescent colorant shown in a general formula [1] introduced organic residue of the carbon numbers 1-50 into $R^1 - R^8$, A, and B for the above reason, stacking and an intermolecular hydrogen bridge are cut and it is expected to have become usable as fluorescent colorant.

[0007]That is, this invention relates to fluorescent colorant which consists of a compound shown with a following general formula [1].

General formula [1]

[0008]

[Formula 2]



[0009]Among [type, although $R^1 - R^8$, A, and B express a hydrogen atom or the organic residue of the carbon numbers 1-50 independently, respectively, at least four of $R^1 - R^8$, A, and B are the organic residue of 1 to 50.]

This invention relates to the above-mentioned fluorescent colorant, wherein the melting point

of the compound shown by a general formula [1] is not less than 250 **.

[0010]This invention relates to the fluorescence body color which makes it come to contain the above-mentioned fluorescent colorant in resin of the shape of a particle which constructed the bridge.

[0011]This invention relates to the fluorescence colored plastic molded product which makes it come to distribute the above-mentioned fluorescence body color in a plastic.

[0012]This invention relates to the fluorescence coloring coating composition containing the above-mentioned fluorescent colorant and the binder for paints.

[0013]This invention relates to the fluorescence coloring ink constituent containing the above-mentioned fluorescent colorant and an ink binder.

[0014]

[Embodiment of the Invention] $R^1 - R^8$, A, and B of the compound shown by the general formula [1] in this invention, Are a hydrogen atom or the organic residue of the carbon numbers 1-50, and as an example of the organic residue of the carbon numbers 1-50, The arylthio group which is not replaced [the aryloxy group which is not replaced / the aryl group which is not replaced / the thioalkoxy group which is not replaced / the alkoxy group which is not replaced / the alkyl group which is not replaced / substitution or /, substitution, or /, substitution, or /, substitution, or /, substitution, or /, substitution, or /, substitution, or] is mentioned.

[0015]As an alkyl group which is not replaced [substitution or], a methyl group, an ethyl group, n-propyl group, A ****- propyl group, a butyl group, a sec-butyl group, a tert-butyl group, A pentyl group, a hexyl group, a heptyl group, an octyl group, the dodecyl, a tetradecyl group, An EOSHIRU group, a heptadecyl group, a hexadecyl group, a cyclohexyl group, The non-substituted alkyl group of the carbon numbers 1-50 of an octadecyl group, a stearyl group, etc., etc. 2-phenylisobutyl group, a trifluoropentyl group, a hexafluoro pentyl group, There is a substituted alkyl group of the carbon numbers 1-50 of benzyl, alpha-phenoxybenzyl group, alpha, and alpha-dimethylbenzyl group, alpha, and alpha-methylphenyl benzyl, alpha, and alpha-ditrifluoromethyl benzyl, a triphenylmethyl group, alpha-benzyloxybenzyl group, etc.

[0016]As an alkoxy group which is not replaced [substitution or], The unreplaced alkoxy group of the carbon numbers 1-50 of n-butoxy group, t-butoxy group, n-octyloxy group, t-octyloxy group, etc., etc. There are substitution alkoxy groups of the carbon numbers 1-50, such as a 1,1,1-tetrafluoro butoxy group and a benzyloxy group, and as a thioalkoxy group which is not replaced [substitution or], There are substitution thioalkoxy groups of the carbon numbers 1-50, such as a 1,1,1-tetrafluoro thiobutoxy group, a benzyloxy group, etc. besides the unreplaced thioalkoxy group of the carbon numbers 1-50 of a thio n-butoxy group, a thio- t-butoxy group, a thio- n-octyloxy group, a thio- t-octyloxy group, etc.

[0017]As an aryl group which is not replaced [substitution or], a phenyl group, 2-methylphenyl group, 3-methylphenyl group, 4-methylphenyl group, 4-ethyl phenyl group, There are a

biphenyl group, 4-methylbiphenyl group, 4-ethylbiphenyl group, 4-cyclohexylbiphenyl group, a terphenyl group, a 3,5-dichlorophenyl group, a naphthyl group, 5-methyl naphthyl group, an anthryl group, a pyrenyl group, etc. As an aryloxy group which is not replaced [substitution or], A phenoxy group, 4-ethyl phenoxy group, 4-propyl phenoxy group, A 4-n-butylphenoxy group, a 4-t-butoxy phenoxy group, a 2-n-octyl phenoxy group, There are substitution aryloxy groups of the carbon numbers 1-50, such as a 1,1,1-tetrafluoro phenoxy group, a biphenyl oxy group, etc. besides the unreplaced aryloxy group of the carbon numbers 1-50, such as a 3-t-octyl phenoxy group.

[0018]As an arylthio group which is not replaced [substitution or], A phenylthio group, 2-methyl phenylthio group, 3-methyl phenylthio group, 4-methyl phenylthio group, 4-ethyl phenylthio group, a biphenyl thio group, There are 4-methylbiphenyl thio group, 4-ethylbiphenyl thio group, 4-cyclohexylbiphenyl thio group, the Taaffe NIOCHIO group, a 3,5-dichloro phenylthio group, a naphthyl thio group, 5-methylnaphthyl thio group, an anthryl thio group, a pyrenyl thio group, etc.

[0019]As an example of the substituent which organic residue may combine, there is an amino group other than the above-mentioned functional group which is not replaced [a halogen atom, substitution, or].

[0020]There are fluorine, chlorine, bromine, and iodine as a halogen atom, and as an amino group which is not replaced [substitution or], There are a diphenylamino group, a ditolylamino group, a phenyl methylamino group, a dibenzylamino group besides dialkyl substituted amino groups, such as an amino group, a dimethylamino group, and a diethylamino group, etc.

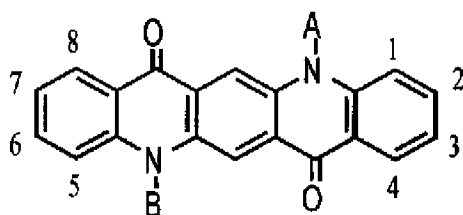
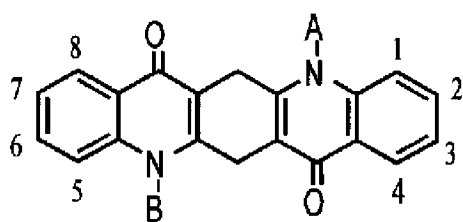
[0021]By adjoining substituents, it may combine with each other, respectively and a phenyl group, a naphthyl group, an anthryl group, a pyrenyl group, etc. may be formed.

[0022]The position in particular that the organic residue of the compound of the general formula [1] in this invention may combine is not limited. However, it is preferred preferably that that it is the 1.4.5.8th place shown in the general formula [2] or A, and B are organic residue, and when A or B is an aryl group, it is still more preferred that 1 or the organic residue of steric exclusion big the 5th place is introduced. It seems that such organic residue serves to cut or pull apart an intermolecular hydrogen bridge.

General formula [2]

[0023]

[Formula 3]



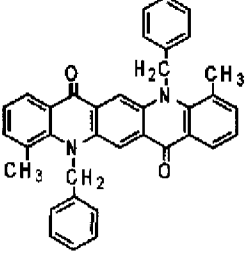
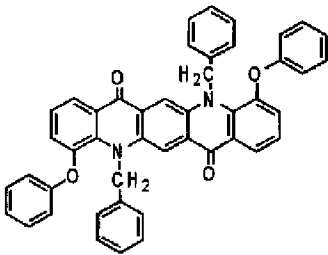
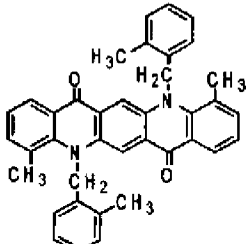
[0024]A and B express a hydrogen atom or the organic residue of the carbon numbers 1-50 independently among [type, respectively.]

generally, a fluorescent pigment or fluorescent dye has the low melting point, and is fluorescent dye of flexibility -- acid In the case of red, it is 208 **. When the melting point of the fluorescent pigment was low and a masterbatch is used, the problem of discoloration, metallic mold dirt, etc. is caused. In order to avoid these problems, the melting point of not less than 250 ** is required at worst.

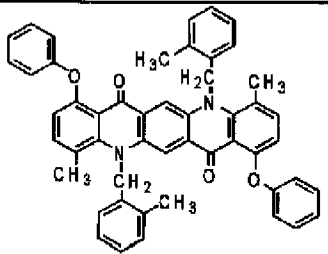
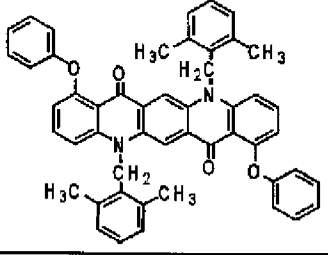
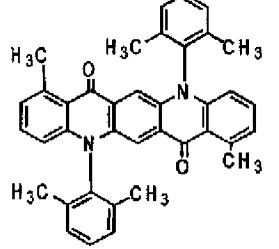
[0025]N.N-dibenzyl-1.5-dimethyl- Quinacridone which is a compound shown by a general formula [1]: The melting point of a compound (1) is as high as 350 **, and it has strong fluorescence. The compound shown by a general formula [1] is compoundable by compounding Quinacridone using the raw material which introduces organic residue into a commercial quinacridone pigment and which is caused especially or has organic residue. The example of the compound shown by a general formula [1] below is illustrated to Table 1.

[0026]

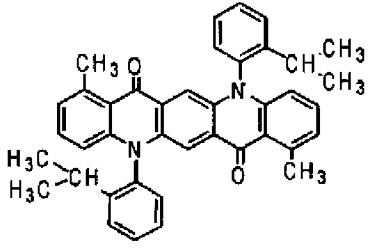
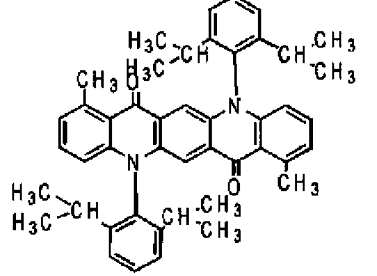
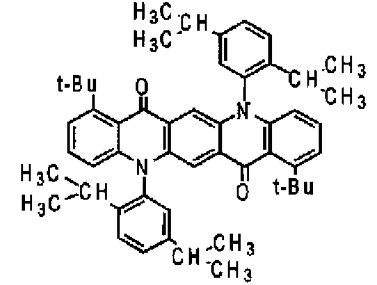
[Table 1]

化合物	化学構造
(1)	
(2)	
(3)	

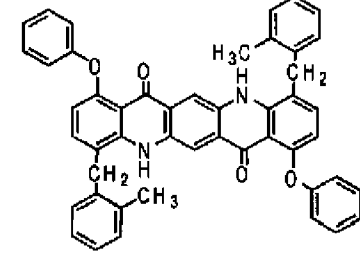
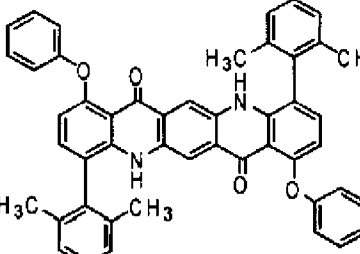
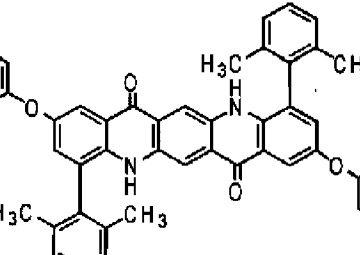
[0027]

化合物	化学構造
(4)	
(5)	
(6)	

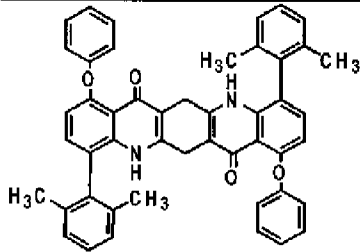
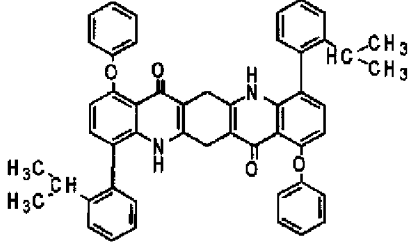
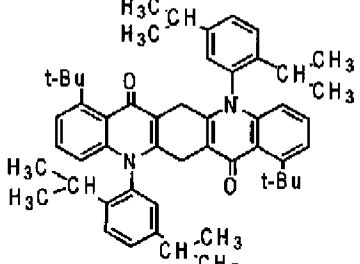
[0028]

化合物	化学構造
(7)	
(8)	
(9)	

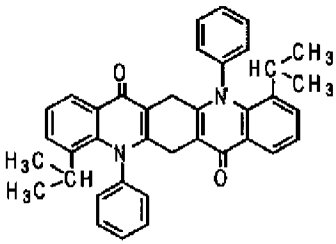
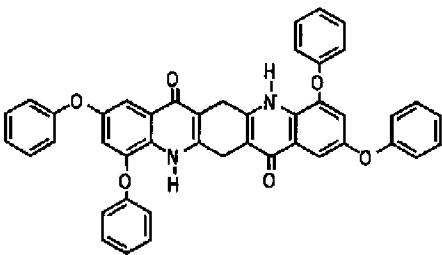
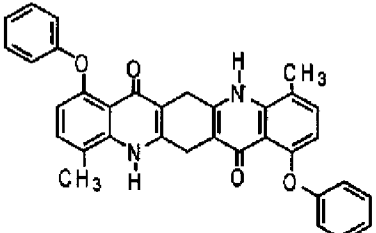
[0029]

化合物	化学構造
(10)	
(11)	
(12)	

[0030]

化合物	化学構造
(13)	
(14)	
(15)	

[0031]

化合物	化学構造
(16)	
(17)	
(18)	

[0032]In a solid state, it has strong fluorescence and the compound shown by a general formula [1] shows the high melting point. For this reason, although the compound shown by a general formula [1] can be used as fluorescent colorant as it is, after distributing the compound shown by a general formula [1] in resin of cross-linking, it can be made to be able to harden and what ground this to particles can also be used as fluorescent colorant. After emulsion-izing the compound shown by a general formula [1] by a drainage system with aqueous resin using an emulsifier or stabilizer, what was hardened and was made into spherical particles can be used as fluorescent colorant. As resin of the above-mentioned cross-linking, an acrylic resin, styrene resin, aromatic sulfonamide resin, an epoxy resin, an alkyd resin, a urea resin, melamine resin, benzoguanamine resin, acryl urethane resin and those copolymers, a copolycondensation resin, etc. can be mentioned. An ultraviolet ray absorbent, an antioxidant, a singlet oxygen quencher, a hindered amine light stabiliser, other stabilizer, and an additive agent can be blended with the above-mentioned resin.

[0033]0.1-100 micrometers of mean particle diameter of said particle are 1-20 micrometers preferably. The concentration of the compound shown by the general formula [1] blended with resin of particles is 0.05 to 10 % of the weight preferably 0.01 to 20% of the weight. Fluorescence intensity becomes it weak that it is low concentration, and it is not more desirable than 0.01 % of the weight.

[0034]As a more concrete manufacturing method of the fluorescent colorant which consists of particle-like resin, For example, after adjusting the mixture of amino compounds, such as benzoguanamine and melamine, and formalin so that pH may serve as the range of 5-10, In the primary reaction thing of the amino resin which made react at the temperature of 50-100 **, and was obtained. The compound shown by a general formula [1] to amino resin 100 weight section 0.1 - 20 weight section, Under stirring in the solution which carries out 0.5-10 weight-section addition preferably, and contains protective colloid agents, such as polyvinyl alcohol, for this in the range of one to 30 weight section to amino resin 100 weight section, It crushes, after a ** exception carries out the hardening resin which supplied, obtained the suspension of amino resin and was subsequently obtained in the curing catalyst of mineral acid, organic acid, etc. by in addition performing polycondensation hardening to this at 40-100 ** to amino resin 100 weight section in the range of 0.01 to 10 weight section and carrying out stoving.

[0035]The fluorescent colorant which consists of the compound shown by a general formula [1] or a compound shown by a general formula [1], and bridge construction resin of particles can be blended with a shaping plastic. Under the present circumstances, fluorescent colorant of this invention can be blended with high concentration, for example, extrusion molding can be carried out to a pellet type, and it can be made with a masterbatch the constituent which consists of dispersing agents, such as base resin and metal soap, and a wax. As resin of the tree for shaping plastics, there are polyolefin resin, such as polyethylene resin and polypropylene resin, polyester resin, polyamide resin, PVC resin, ABS plastics, styrene resin, an acrylic resin, polycarbonate resin, urethane resin, amino resin, etc. Let these thermoplastics be a plastic-molding thing by the method of inflation molding, calender molding, and others. Fluorescent colorant of this invention can be blended with thermosetting plastic, such as an epoxy resin, phenol resin, polyester resin, polyester imide resin, and polyamide imide resin.

[0036]Fluorescent colorant of this invention Rosin acid soap, stearic acid soap, oleic acid soap, Surface-active agents, such as Na-di-beta-naphthyl methane JISARUFATO, Na-lauryl sulfate, Na-diethylhexylsulfo- KUSHINETO, and Na-dioctylsulfo- Cush Nate, can distribute, and it can be considered as the colorant constituents a paint, for ink, etc.

[0037]It is meltable to an organic solvent and the compound shown by a general formula [1] can blend this with a paint or ink as fluorescent colorant of solvent insolubility which consists of remaining as it is or particles of resin. As ink, there are printer's ink, such as offset printing ink, gravure printing ink, and a silk screen, ink for ink jets, autograph ink, etc. As paint resin and resin for ink, polymethyl acrylate, Acrylic resins, such as polyethylacrylate, polymethylmethacrylate, and polyvinyl acrylate, Polyurethane resin, acryl urethane resin, polyester resin, polyarylate resin, Vinyl chloride resin, an ethylene-vinylacetate copolymer, polyvinyl formal resin, Amino resin, an alkyd resin, an epoxy resin, phenol resin, polyester resin, Polyester imide resin, polyamide imide resin, silicone resin, Elasticity, such as

polyvinylidene chloride resin, polyethylene vinyl alcohol resin, polyolefin resin, vinylidene chloride resin, butadiene resins, styrene resin, phenoxy resin, polyamide resin, cellophane, ethyl cellulose, and a nitrocellulose, rigid resin, etc. can be mentioned. The blending ratio of fluorescent colorant of this invention is 0.5 to 10 % of the weight preferably 0.1 to 20% of the weight to a coating composition or the whole ink composition.

[0038]Fluorescent colorant of this invention can raise light stability-proof by using it with an ultraviolet ray absorbent. An ultraviolet ray absorbent o-hydroxybenzophenone, 2-hydroxy-4-n-octoxybenzophenone, Benzophenone series, such as 2-hydroxy-4-methoxybenzophenone, 2-(2'-hydroxyphenyl) benzotriazol, 2-(2'-hydroxy-5'-t-octylphenyl) benzotriazol, A 2-(2'-hydroxy-3'-t-butyl-5'-methylphenyl)-5-chlorobenzotriazole, Benzotriazols, such as 2-(2'-hydroxy-5'-methylphenyl) benzotriazol, Cyanoacrylate systems, such as ethyl-2-cyano 3,3-diphenyl acrylate and 5-ethylhexyl 2-cyano 3,3-diphenyl acrylate, Salicylic acid systems, such as phenyl salicylate and 4-t-butyl phenyl salicylate, Ultrafine particle inorganic matter systems, such as oxalic acid anilide systems, such as 2-ethyl-5'-t-butyl-2'-ethoxy-N,N'-JIFENIROKISARUAMIDO, a zinc oxide, titanium oxide, and zirconium oxide, etc. can be used.

[0039]

[Example]Hereafter, this invention is explained still in detail based on an example. A part expresses a weight section among an example.

The synthetic example 1 (composition of a compound (1))

In 300 copies of dioxanes, 24 copies of succinyl succinate dimethyl, 50 copies of 2-amino-1-methylbenzenes, and 1.5 copies of 35% chlorides were put, and heating churning was carried out at 95 ** for 3 hours. Then, it diluted with the methanol water of 500 copies, and rare sodium hydroxide solution neutralized. The ***** exception carried out the depositing yellow solid, and 500 copies of methanol washed further. The obtained yellow solid was dried at 70 **, and 43 copies of needle crystals which have yellow fluorescence were obtained.

[0040]Heating stirring was performed for 50 copies of this yellow needle crystal at 250 ** under the nitrogen air current with 300 copies of 1-methylnaphthalenes for 10 hours. Then, the ***** exception carried out the orange solid which added 300 copies of methanol and deposited. The orange solid obtained by 300 copies of methanol washing was dried at 70 **, and 28 copies of light orange powder which has whitish and orange fluorescence were obtained.

[0041]Heating stirring was performed for 20 copies of this light orange crystal for 10 minutes at 280 ** under the air air current with 200 copies of dibutyl phtalate. Then, the ***** exception carried out the purple solid which added 300 copies of methanol and deposited. The purple solid obtained by 300 copies of methanol washing was dried at 70 **, and 18 copies of purple powder which has orange fluorescence were obtained. Heating stirring was performed for 18 copies of this purple powder at 100 ** for 10 hours with 400 copies of dichlorobenzenes, 1000 copies of 50% caustic soda solution, nine copies of benzyl triethyl ammonium chloride, and

160 copies of benzylbromide. Then, 300 copies of chloroform was added and the resultant was extracted. This chloroform layer was washed with water until it became neutrality, and it condensed after desiccation, the column chromatography using silica gel refined, and eight copies of powder which reprecipitates with methanol and has orange fluorescence were obtained. It checked that it was a compound (1) as a result of molecular weight analysis. The fluorescence spectrum of output is shown in drawing 1. The melting point of this compound was 350 **.

The synthetic example 2 (composition of a compound (3))

Heating churning of eight copies of 1,5-dimethyl Quinacridone, 140 copies of benzene, 500 copies of 50% caustic soda solution, six copies of benzyl triethyl ammonium chloride, and 50 copies of alpha-bromo-o-xylene was violently carried out at 80 ** among the flask for 30 hours. Then, the decantation separated the solid part, the water of 500 copies washed, and chloroform extracted. This chloroform layer was condensed and eight copies of red solids were obtained. The column chromatography using silica gel refined and three copies of powder which reprecipitates with methanol and has yellow fluorescence were obtained. It checked that it was a compound (3) as a result of molecular weight analysis. The fluorescence spectrum of output is shown in drawing 2. This compound showed the melting point of 320 **.

30 copies of powder of the compound (1) obtained in the example 1 of example 1 composition, polyethylene (trade name by Sumitomo Chemical Co., Ltd. "SUMIKASEN G-808" 30 copies) And polyethylene wax (trade name by the Mitsuhiro chemical industry company "Sun Wacks 131P" 40 copies were pelletized after kneading and with an extrusion machine by the kneader, and the master birch was obtained.) It is high density polyethylene (trade name by Mitsui Petrochemical Industries, Ltd. "high ZEKKUSU 2208" it mixed with 100 copies and the resin-molding thing was obtained by extrusion molding.) about four copies of this masterbatch. As a result of observing change of fading after 72-hour exposure visually, without carrying out water injection for this with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted.

The same operation as Example 1 was repeated except having changed the compound (1) in example 2 Example 1 into the compound (3). As a result of observing change of fading after 72-hour exposure visually, without this resin-molding thing carrying out water injection with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted. Except having changed the compound (1) in example 3 Example 1 into the compound (6), the same operation as Example 1 was repeated, and the master birch was obtained. They are ABS plastics (it mixed with 100 copies of **** Naugatuck trade names "Kula Russ Chick MH", and the resin-molding thing was obtained by extrusion molding.) about four copies of this masterbatch. As a result of observing change of fading after 100-hour exposure visually, without carrying out water injection for this with a sunshine weather meter, the fall of

fluorescence and change of coloring were not accepted.

The same operation as Example 3 was repeated except having replaced the compound (8) with for the compound (6) in example 4 Example 3. As a result of observing change of fading after 100-hour exposure visually, without this resin-molding thing carrying out water injection with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted.

Into example 5 flask, ten copies of melamine, 60 copies of paraformaldehyde, and 40 copies of p-toluenesulfonamide are taught, and melting is carried out at 50-100 **. Ten copies of compounds (6) were added, heating stirring was performed at further 120-150 ** for 30 minutes, and the melamine resin fluorescence coloring matter was obtained. The powder of the fluorescent colorant which has clear yellow was obtained by a mortar's grinding this fluorescence coloring matter lightly, and grinding with a ball mill further for 1 hour. Even if it saved this fluorescent colorant in a 108 ** homoiothermal layer for 2 hours, the fall of fluorescence and change of coloring were not accepted.

40 copies of dioctyl phthalates and five copies of stabilizer are added to 100 copies of example 6 polyvinyl chloride, After adding one copy of fluorescent colorant obtained in Example 1, respectively to 50 copies of vinyl chloride powder processed with the conventional method and mixing uniformly, the coloring chloridation vinyl sheet of kneading yellow was obtained for 10 minutes at 160 ** with 2 rolls. This coloring chloridation vinyl sheet was put on the mirror plane board, press forming was carried out at the temperature of 160 ** using 0.1 mm in thickness, 100 mm long, and a 100-mm-wide spacer, and the yellow coloured film-like Plastic solid was acquired. As a result of observing change of fading after 100-hour exposure visually, without carrying out water injection for this with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted even 100 passage of time after.

The same operation as Example 6 was repeated except having replaced the compound (1) with the compound (11) in example 7 Example 6. As a result of observing change of fading after 100-hour exposure visually, without this fluorescent colorant carrying out water injection with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted even 100 passage of time after.

Into the example 8 flask, ten copies of melamine, 60 copies of paraformaldehyde, and 40 copies of p-toluenesulfonamide were taught, and melting was carried out at 50-100 **. Ten copies of compounds (6) obtained in Example 2 were added, heating stirring was performed at further 120-150 ** for 30 minutes, and the melamine resin coloring matter was obtained. Even if it saved this fluorescent colorant in a 108 ** homoiothermal layer for 2 hours, the fall of fluorescence and change of coloring were not accepted.

The same operation as Example 8 was repeated except having replaced the compound (6) with the compound (10) in example 9 Example 8. Even if it saved this fluorescent colorant in a

108 ** homiothermal layer for 2 hours, the fall of fluorescence and change of coloring were not accepted.

Into the example 10 flask, 80 copies of methyl methacrylate, 20 copies of divinylbenzenes, and 0.8 copy of azobisisobutyronitrile were taught, and melting was carried out at 50-100 **. Ten copies of compounds (9) were added to this, it stirred by having added three copies of polyvinyl alcohol, and 200 copies of water further, and the suspension of the fluorescence coloring matter of a monomer colored yellow was obtained. This suspension was heated, and polymerization curing of the polymerization reaction was performed and carried out.

Fluorescent colorant was separated from suspension and the powder of the fluorescent colorant which grinds with a ball mill for 1 hour, and has clear yellow was obtained after desiccation. Even if it saved this fluorescent colorant in a 108 ** homiothermal layer for 2 hours, the fall of fluorescence and change of coloring were not accepted.

60% five copies of fluorescent colorant, 55 copies of alkyd resin dispersed matter [alkyd resin solid content which were manufactured in example 11 Example 7, 230 copies of ceramic balls of 35 copies of melamine resin (50% of solid content), two copies of xylene, and methyl glycol (2-methoxyethanol) 2 copy] and 8 mmphi were put into a 400-ml glass jar, and it was made to distribute for 30 minutes at the revolving speed of 120 rpm. The obtained dispersed matter was applied to the metal plate, it printed for 3 minutes at 180 **, and the coated plate was obtained. As a result of observing change of fading after 100-hour exposure visually, without carrying out water injection for this with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted.

Example 12 compound (2) 1.0 copy, 49 copies of varnishes for aquosity photogravures (styrene acrylic acid type), 150 copies of 3 mmphi glass beads were put into a 225-ml mayonnaise bottle, 35 copies of varnishes for an addition were added after 90-minute distribution by pane ipecac DESHONA, it distributed by the paint conditioner for 10 more minutes, the ** exception carried out the glass bead, and fluorescence aqueous gravure ink was obtained. As a result of carrying out drawdown of this ink to the Manila board paper by #3 bar coating machine, measuring change of fading after 48-hour exposure with a color difference meter, without carrying out water injection for this with a sunshine weather meter and asking for the delta E, it was set to 2.5 and the fall of fluorescence and change of coloring were not accepted.

4 rotation kneading meat of 0.5 copy and 50 copies of varnishes for rosin phenol resin system offset was carried out for example 13 compound (3) 150 lbs 100 revolutions by Hoover style Mahler, ink was adjusted, and drawdown of this was carried out to art paper using the small rotary press (RI tester). As a result of measuring change of fading after 48-hour exposure with a color difference meter, without carrying out water injection for this with a sunshine weather meter and asking for the delta E, it was set to 1.5 and the fall of fluorescence and change of

coloring were not accepted.

Example 14 compound (3) 0.3 copy, 30.7 copies of petroleum solvents (the product made from shell chemicals, shell ZORU AB), For 20 minutes, stirring mixing was carried out, the ** exception carried out 15 copies of dimethyl sulfoxide, and 54 copies of N-methyl-2-pyrrolidone with a 0.45-micro membrane filter, recording ink was made, and it recorded on the regular paper using the printer of a piezo method. As a result of observing change of fading after 100-hour exposure visually, without carrying out water injection for this with a sunshine weather meter, the fall of fluorescence and change of coloring were not accepted.

30 copies of powder of comparative example 1N,N-di-n-butyl Quinacridone, polyethylene (trade name by Sumitomo Chemical Co., Ltd. "SUMIKASEN G-808" 30 copies) And polyethylene wax (trade name by the Mitsuhiro chemical industry company "Sun Wacks 131P" 40 copies were pelletized after kneading and with an extrusion machine by the kneader, and the master batch was obtained.) It is high density polyethylene (trade name by Mitsui Petrochemical Industries, Ltd. "high ZEKKUSU 2208" it mixed with 100 copies and the resin-molding thing was obtained by extrusion molding.) about four copies of this masterbatch. As a result of measuring change of fading after 48-hour exposure with a color difference meter, without carrying out water injection for this with a sunshine weather meter and asking for the delta E, it was set to 11.7 and the fall of fluorescence and change of coloring were accepted. [0042]if the comparative example 1 is compared with Example 1, by introducing or more 4 organicity residue into the basic skeleton of a general formula [1], lightfastness will be markedly alike and will improve -- it became clear.

[0043]

[Effect of the Invention]Fluorescent colorant of this invention is blending with a plastic-molding thing, a coating composition, an ink composition, etc., a splendid fluorescence color is given and there is the feature of moreover excelling in heat resistance and lightfastness as compared with the fluorescent colorant known conventionally.

[Translation done.]